TUBERCULOSIS IN MEDICAL DOCTORS IN KWAZULU-NATAL, SOUTH AFRICA: PERSONAL EXPERIENCES AND PERCEPTIONS RELATED TO THEIR DIAGNOSIS AND TREATMENT

Submitted by

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DECLARATION

I, Ashantha Naidoo, Student number 983176869, declare that:

i. The research undertaken in partial fulfilment of the degree M Med (Family Medicine), and entitled “Tuberculosis in medical doctors in KwaZulu-Natal (South Africa): Personal experiences and perceptions related to their diagnosis and treatment”, and reported in this dissertation is my own work, except where otherwise stated and acknowledged.

ii. This dissertation has not been submitted for any degree or examination to any other university.

Student signature:_____ Date: _____

I, Professor U.G. Lalloo, the supervisor of the above student, agree to the manuscript being submitted for examination by the University of KwaZulu-Natal.

Supervisor signature:_____ Date: _____

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i. Professor U.G. Lalloo, my supervisor

ii. Ms Tonya Esterhuizen and Mr Stephan van der Linde, of the Biostatistics Unit at the Nelson R Mandela School of Medicine

I would also like to acknowledge and thank all the research participants for their co-operation and willingness to contribute to this study and current evidence on this subject.

DEDICATION

This research project is dedicated to my brother, Dr Uvistra Naidoo, whose own trials and tribulations during his illness with multidrug resistant tuberculosis inspired me to carry out this study. I admire your courage, resilience and your untiring dedication to your patients and profession despite the pitfalls you experienced during and after your illness.

This project is also a tribute to my wonderful parents, Professor SS Naidoo and Mrs Selvie Naidoo. Your infinite wisdom and unconditional love are the foundations and pillars of my success!

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ABBREVIATIONS

CDC	Centers for Disease Control
COIDA	Compensation for Occupational Injuries and Diseases Act
HCW	Health Care Worker
HIV	Human Immunodeficiency Virus
KZN	KwaZulu-Natal
MRI	Magnetic Resonance Imaging
MDR	Multiple Drug Resistance
TB	Tuberculosis
WHO	World Health Organization

ABSTRACT

Title:

Tuberculosis in medical doctors in KwaZulu-Natal (South Africa): Personal experiences and reflections related to their diagnosis and treatment.

Background:

The high tuberculosis (TB) incidence and prevalence fuelled by the concomitant HIV epidemic in South Africa has resulted in a high rate of tuberculosis infection in health care workers. This is the first study to investigate the experiences and reflections of doctors who were diagnosed with active TB during their employment in high TB burden hospitals in KwaZulu-Natal, South Africa.

Methods:

Consecutive medical doctors working in both the public and private sectors and who were treated for active tuberculosis between 2007 and 2010 were contacted to participate in the study. Each participant completed an informed consent and a validated anonymous self-administered questionnaire. The study received ethical approval from the University of KwaZulu-Natal.

Results:

Forty doctors participated in the study. The mean age of participants was 33.67±10.63 years. The majority were between 21 and 40 years of age (males (52.5%), and employed in the public sector (95%). Four (10%) had MDR-TB. A number of participants were referred for costly special investigations which are not considered to be part of first line care in South Africa. For example, 15

participants (37.5%) underwent chest CAT scans during the diagnostic period. Eight doctors reported complications following invasive procedures.

Nineteen (47.5%) of the 33 participants (82.5%) who had experienced side-effects related to anti-TB drugs had considered defaulting on their treatment because of the side-effects of these drugs. Many participants expressed concerns about the uncaring attitudes of senior medical colleagues and hospital management. The majority of participants had introspected on their illnesses and experiences and committed themselves to become more caring and empathic towards their patients in future.

Conclusions:

All health care workers and particularly nurses and medical doctors working in environments with a high burden of infectious diseases such as HIV and TB, are at increased risk to TB infection. They encounter various personal and professional problems following contraction of TB infection. These experiences had impacted in many ways on their professional lives, and some doctors have since left the medical profession because of these experiences. The risks associated with TB must be minimised. Much more therefore remains to be done in the public health care system if these trends are to be reversed; this includes health policy changes, health system changes and attitudes of medical colleagues towards medical doctors who become “victims of illnesses acquired in the course of duty”.

CHAPTER 1

1.1 Introduction

The current tuberculosis (TB) epidemic sweeping through South Africa is considered to be one of the worst in the world; it has a high burden of disease, incidence rate, and Human immunodeficiency virus (HIV) co-infection rates. Additionally, it is accompanied by an increasing rate of drug resistance (Abdool Karim et al., 2009).The incidence of TB in South Africa has risen from 556 cases per 100 000 population in 2002 to an estimated 600 per 100 000 population in 2007(National Department of Health, 2007). This epidemic is being fuelled by the concomitant HIV epidemic (Abdool Karim et al., 2009, Padayatchi et al., 2010).

Occupational exposure towards TB constitutes a major health hazard for all health care workers (HCW) throughout the world, and especially in developing and resource-constrained countries or settings (Ramphal-Naley et al., 1996, Kruuner et al., 2001, Plitt et al., 2001, Bonifacio et al., 2002, Yanai et al., 2003, Laniado-Laborin and Cabrales-Vargas, 2006, Galgalo et al., 2008, Deribew et al., 2009).

Although sub-Saharan Africa has the highest rates of TB in the world, the rates of TB among health care workers are poorly documented (Naidoo and Jinabhai, 2006). Further, whilst many studies have been conducted globally on the psychological impact of TB on general populations, there is minimal evidence of such work on medical doctors (Padayatchi et al., 2010).

Medical doctors are at great risk of acquiring TB whilst on duty in both public and private health care facilities, and especially in the resource-constrained and heavily disease burdened public health care sector (Naidoo and Jinabhai, 2006, Padayatchi et al., 2010). The risk of acquiring any nosocomial infection and especially drug-resistant Mycobacterium TB is also increased by virtue of working in close proximity to infected patients and other staff who have co-existent HIV infection, and therefore compromised immunity and increased susceptibility to opportunistic infections.

1.2 Problem statement

There are no published reports on the experiences of medical doctors infected with TB during the period of symptom and sign presentation, diagnosis and management of their illnesses. There is also minimal information currently available on how medical doctors cope during their illnesses (Padayatchi et al., 2010).

1.3 Rationale for study

This study will contribute enormously to current knowledge on the personal experiences, impact and reflections of medical doctors with active TB infection acquired through nosocomial transmission or re-activation of pre-existing disease, especially those who are working in the public health care sector. It will also provide a better understanding of the feelings of such doctors towards their medical colleagues, hospital management and their current practice of medicine.
This study will enable us to gain valuable insight into the help-seeking behaviour of medical doctors with overt or covert presentations suggestive of TB infection, their interactions with the health care system to seek treatment, and the attitudes of

management and fellow colleagues in the work place towards them following diagnosis and treatment.

1.4 Study hypothesis

This was not a hypothesis testing or generating study.

1.5 Aim of study

This study investigated the personal experiences and reflections of medical doctors infected with TB towards diagnosis and treatment of their illness.

1.6 Objectives of study

In order to achieve the aim, the following specific objectives were pursued:

i. To describe the demographic profile of medical doctors diagnosed with TB (in terms of race, age, sex, clinical discipline/place of employment, co-morbid disease).
ii. To determine the symptoms and signs at the time of presentation.
iii. To document the methods used in the diagnosis of infection with TB (sputum microscopy, culture; histological samples; clinical suspicion; radiological features).
iv. To measure the time-lag or period from time of first symptoms to clinical presentation to date of diagnosis and commencement of pharmacotherapy and completion of pharmacotherapy.
v. To ascertain the extent to which the generally accepted treatment guidelines (adopted by the National Department of Health) for the management of TB were followed when diagnosing and treating medical doctors.

vi. To determine the prevalence of side- effects or adverse effects of anti-TB drug therapy, and the methods used to overcome these side-effects.

1.6 Organization of mini-thesis

This chapter has provided an overview of the study including the background, the rationale for the study, the study aim and objectives.

Chapter two describes a review of the literature relating to the burden of TB infection and care in KwaZulu-Natal, including the burden and impact of nosocomial TB on health care workers especially those in constant contact with patients infected with the Human immunodeficiency virus (HIV) and Mycobacterium tuberculosis, such as nurses and medical doctors.

Chapter three presents a description of the study methodology.

Chapter four presents the results and findings of the study.

Discussion and conclusions emanating from the findings are presented in Chapter five.

Relevant documents pertaining to the study are presented as annexures.

CHAPTER 2

LITERATURE REVIEW

A literature search was done using the Medline database. The key words that were used were: tuberculosis, health care worker, psycho-social impact, Africa, South Africa.

The following themes are reflected in this review of the literature:

i. Incidence and prevalence of TB infection in health care workers globally and in South Africa
ii. Perceptions towards TB infection by general patients and health care workers
iii. Impact of TB on lives of patients with tuberculosis infection
iv. Adherence to TB medications
v. Interventions and programmes to reduce nosocomial transmission of TB infection

2.1 Incidence and prevalence of tuberculosis in health care workers

Tuberculosis has reached epidemic proportions in Sub-Saharan Africa (Abdool Karim et al., 2009). The incidence of TB in South Africa has risen from 556 cases per 100 000 population in 2002 to an estimate of 600 per 100 000 population in 2007 (National Department of Health, 2007). This epidemic is being fuelled by the HIV epidemic (Abdool Karim et al., 2009, Padayatchi et al., 2010). A study by Colvin et al.(2001) found that the prevalence of HIV and HIV related diseases and TB in adult medical wards in a tertiary hospital in KwaZulu-Natal (South Africa) was high (Colvin et al., 2001). They studied 507 in-patients, and found that 54% were

infected with HIV and pulmonary TB was present in 56% of HIV cases. The World Health Organization(WHO) Global TB report for 2005 estimated that 61% of TB patients in South Africa were HIV co-infected (World Health Organisation, 2005).

Occupational exposure towards TB constitutes a major health hazard for all health care workers (HCW) throughout the world, and especially in developing and resource-constrained countries or settings (Kruuner et al., 2001, Plitt et al., 2001, Bonifacio et al., 2002, Yanai et al., 2003, Laniado-Laborin and Cabrales-Vargas, 2006, Galgalo et al., 2008, Deribew et al., 2009). Nosocomial outbreaks of TB among HCWs are well documented in many countries such as the United States of America (Menzies et al., 1995). However, although sub-Saharan Africa has the highest rates of TB in the world, the rates of TB amongst HCWs are poorly documented (Naidoo and Jinabhai, 2006). A recent study showed an alarming five to six fold increase in the incidence of hospital admissions for drug resistant TB among HCWs in KwaZulu-Natal, South Africa, compared to the general population (O' Donnell et al., 2010).

Whilst a number of general population studies have been conducted globally on the attitudes and psychological impact of contacting TB (Somma et al., 2008, Deribew et al., 2009, Zhang et al., 2010, Rundi, 2010, Karim et al., 2011), little or no work has been done in this regard amongst health care workers generally and particularly among doctors who (by virtue of their nature of work) are at greater risk of being infected than the general population. A qualitative study by Padayatchi et al. (2010) on the impact of drug-resistant TB on five medical doctors in South Africa found that four of them experienced adverse effects due to medication, and in a few, these effects continued for several years after treatment was completed.

In addition, they found prolonged morbidity, psychological disturbances, poor infection control and support structures in their working environment, and attrition of doctors from the field. (Padayatchi et al., 2010) However, there are no published reports on the experiences and reflections of TB infected doctors during the period relating to diagnosis, investigation, procedures and management.

A study in a local South African hospital concluded that the frequency of TB among staff had increased substantially between 1991 and 1996, and that this increase was associated with a rapidly expanding HIV epidemic in the community (Wilkinson and Gilks, 1998). It was further observed in this study that during this period the incidence of TB amongst HCWs (558 per 100 000) and ancillary staff (445 per100 000) was not significantly different ($p = 0.7$), but was lower than the incidence among 20-59 year old people in the community (1543 per 100 000).

Studies conducted within local hospitals in Malawi found that the TB infection rates were much higher amongst HCWs than amongst the general population (Harries et al., 1997, Harries et al., 1999, Harries et al., 2002, Kanyerere and Salaniponi, 2003). In 1999, Harries and co-workers reported that the notification rate amongst HCWs within district hospitals in Blantyre was 12 times higher than the general population (Harries et al., 1999). A 2001 retrospective review of hospital records from a Malawi hospital demonstrated TB rates significantly higher in HCWs compared to the general population (5780 vs. 240 per 100 000 population) (Kanyerere and Salaniponi, 2003). The same study also found TB rates to be higher in patient attendants compared to nurses and doctors, and additionally found that many health care workers were incorrectly diagnosed as smear negative pulmonary TB without undergoing sputum smear examination.

Failure to follow national guidelines in the diagnosis and treatment of TB generally can also influence nosocomial transmission and not improve notification rates. A study conducted in Somalia showed that few doctors followed the national guidelines (Suleiman et al., 2003). This cross-sectional study of 53 doctors working within the private and public sectors in North-Western Somalia reported inadequate knowledge among doctors regarding updated tuberculosis management protocols. The authors concluded that these findings posed a threat to TB control in Somalia (Suleiman et al., 2003).

Other studies have shown that the risk of developing TB amongst HWCs was dependent on factors such as occupational category, age and use of TB infection control measures in the workplace (Wilkinson and Gilks, 1998, Ngamvithayapong et al., 2000, Alonso-Echanove et al., 2001).

A review of KwaZulu-Natal (KZN) hospital records from the period 1999 to 2004 conducted by Naidoo and Jinabhai, demonstrated an alarmingly high incidence of TB among HWCs, a high incidence in the younger age groups and poorer treatment outcomes. TB incidence among HCWs during the study period was 1113(± 282.8) per 100 000 HCW(Naidoo and Jinabhai, 2006).

2.2 Attitudes, perceptions and psycho-social attributes of patients towards tuberculosis

Denials by patients of having contracted or suffering from tuberculosis have been an ongoing problem amongst the ordinary patients (Rowe et al., 2005, Jakubowiak et al., 2008, Karim et al., 2011). Karim and co-workers were of the view that this could be due to the social stigma attached to the conditions (Karim et al., 2011).

They found that this could account for non-adherence to treatment particularly in female patients in Bangladesh. Tuberculosis related stigma have been shown to worsen the quality of life of patients in that this perception or attitude could have an impact on help or health care seeking behaviour (Somma et al., 2008, Weiss et al., 2008). A study conducted in Russia showed that certain social circumstances (such as unemployment, homelessness, imprisonment or poverty) and psychological factors (such as low or depressed mood, mood swings and having little confidence in medical staff) could account for the poor adherence to treatment (Jakubowiak et al., 2008). Similar findings have also been reported in a study conducted in Peru (Shin et al., 2008). A study undertaken in one of the impoverished islands of Malaysia where people lead a mainly rural way of life, showed that patients with tuberculosis, who were not educated about the causes of TB , felt embarrassed about contracting the disease; additionally, the negative attitudes of healthcare staff inhibited them from seeking treatment earlier (Rundi, 2010) .

2.3 Impact of tuberculosis on the quality of life of the general population

Most studies have shown clearly a direct relationship between the contraction of TB and social stigma (Rundi, 2010, Karim et al., 2011). Such stigma associated with the condition have led to social isolation and even living as a single person with poor prospect of marriage (Rundi, 2010). This perceived and enacted stigma towards tuberculosis patients in East Malaysia included the practice of TB patients using separate utensils and deliberate acts of marginalising them socially from the community. The resultant psycho-social impact on their quality of life has been reported to be immense, and this included low self-esteem, and voluntary social withdrawal. All of these factors had contributed to a vicious cycle, and therefore

caused more hardship for patients. Patients in this study complained of weakness and never recovered fully from the infection (Rundi, 2010). These findings have been supported by other studies conducted by Zang *et al.* (2010) and by Karim *et al.* (2011). For example, students in Shaanxi province of China felt that their mental health was affected adversely following TB infection (Zhang et al., 2010). Other studies showed that the fear of infecting others led to isolation from the rest of the family in some cases (Zhang et al., 2010, Karim et al., 2011) or even depression and suicidal behaviour (Shin et al., 2008, Rundi, 2010).

A study in India showed that TB patients had significantly worse quality of life compared to normal individuals especially in the physical and psychological domains. However, women patients had better scores in physical and psychological domains than male patients before the onset of treatment, inferring that women had better coping skills (Dhuria et al., 2009). In addition, they found that treatment improved all facets of quality of life but significant deficits still existed in social and environmental domains. Similar findings were observed in the United States of America (Hansel et al., 2004). In the latter study, TB was found to affect all predicted domains of quality of life such as general health perceptions, somatic sensations, psychological health, spiritual well-being, and physical, social and role functioning of patients. In addition, social stigmatization, isolation, pill burden, long duration of therapy, sexual dysfunction, loss of income, and fear were other specific predictors of quality of life identified in these patients.

A study by Deribew and co-workers in Ethiopia revealed similar findings in that TB/HIV co-infected patients had a lower quality of life in all domains such as depression, diminished income and less family support, as compared to HIV

infected patients without active TB: (Deribew et al., 2009). Co-infected patients who had depression and did not have family support or income were more likely to have poor physical and psychological health as compared to individuals without depression, good family support and income (Deribew et al., 2009). Furthermore, this study found that stigma was associated with a poor quality of life in the psychological domain (Deribew et al., 2009). Similar findings were reported in a study undertaken in Equador which has the highest TB prevalence and incidence in the American regions (Armijos et al., 2008). The lifestyles of TB patients undergo significant changes when it comes to physical activity, diet and social activities. The participants in this study were of the view that these changes were necessary for the affected persons to get better or even cured and to reduce the rate of infecting others. About 50% of the participants felt that being infected reduced one's ability to adequately carry out one's duties at the work place, home or at school. In addition, a significant number felt that TB impacted on the person's paid employment because of TB-associated fatigue and malaise, and the constant need to seek treatment or rest reduced the number of hours of work in paid employment. The stigma that arose as a consequence of the infection were separated into two types. One was described as an internalised stigma where the participants indicated that they themselves suffered significant psychological and emotional distress, such as feeling of isolation, loneliness, sadness, or shame from learning that they had to be tested for TB and expressed being ashamed of having persistent and chronic cough. Some of the participants were also worried that others would think that they were using their symptoms just as an excuse not to work. The other stigma was categorized as social stigma: the response from their social network, such as close friends, colleagues, family members or even their employers towards the patients on receiving the news that they were undergoing a

test for TB or being diagnosed as having TB. However, many indicated that the family members were very supportive towards them, and whilst some indicated that their employers were very supportive, others indicated that some of them were even dismissed from work on receiving the news of being TB inflicted (Armijos et al., 2008).The findings of this study in Equador relating to stigmatisation were supported by others (Hansel et al., 2004, Shin et al., 2008, Dhuria et al., 2009, Rundi, 2010, Zhang et al., 2010, Karim et al., 2011) .

In a rural area of Bangladesh it was found that female patients were looked down upon by society. Whilst men expressed that they were able to cough up with an audible grunt and spit sputum anywhere, women on the other hand, could not do so in public and this led them to suppress their coughs and swallow their spit. Furthermore, TB caused women to be ashamed of themselves. Because of the social stigma attached to contracting TB, most patients would first seek home remedies such as eating bats and frog meat, drinking juice of basil leaves in hot water, wearing amulets, rubbing with hot oil and garlic, and when these methods failed, they resorted to outside help such as drug dealers, village doctors or herbalists. If all these measures failed, they would consult medical help as a last resort. Women participants, however, would seek help in secret. This was because of the greater social stigma attached to women sufferers. Many experienced mental suffering which was caused by the thought of dying and fear of social neglect especially in the case of women sufferers, who feared that their husbands would leave them. Both male and female sufferers felt that they would face ostracism, denial and apathy by the community. This led to different forms of mental torture (Karim et al., 2011).

2.4 Adherence to Medication

In a study conducted in Peru, it was found that depression, low social support, poor quality of life and substance use were the main barriers to adherence in impoverished HIV-TB co-infected people (Shin et al., 2008). Studies done in Russia found that certain social, psychological and behavioural characteristics of TB patients, such as being male, unemployed, having a technical college education, a history of imprisonment, a bad mood or mood swings, having little confidence in medical staff, not believing that they will fully recover, and reluctance to continue treatment ,had all contributed to non-adherence (Atun et al., 2005, Dimitrova et al., 2005, Fry et al., 2005, Jakubowiak et al., 2008).

2.5 Perceptions, attitudes, and psychosocial impact of TB on health care providers, in particular medical doctors.

Health care workers are at greater risk for TB, including multidrug-resistant TB (MDR-TB), compared to the general population (O' Donnell et al., 2010). The psychosocial impact of nosocomial TB on HCWs has received little attention in the literature (Padayatchi et al., 2010). These researchers found five main themes emerging from their case study on five medical doctors who had contracted TB whilst on duty viz. prolonged morbidity, psychological impact, poor infection control, weak support structures, and attrition from the clinical field as medical doctors. Prioritisation of TB infection control measures and strict practice according to universal guidelines have been highlighted in this and other studies (Naidoo and Jinabhai, 2006, Padayatchi et al., 2010).

2.6 Interventions or programmes to minimise nosocomial transmission

Physicians and other health care workers are at constant risk to nosocomial transmission of Mycobacterium tuberculosis, especially because of their nature of work among patients with active tuberculosis and concomitant HIV infection and associated opportunistic infections. The extent of this risk varies from country to country, and is dependent on the prevalence of tuberculosis and HIV in the community, the area of work, type of clinical duties, and the effectiveness of local infection control measures(Rao et al., 2004, O' Donnell et al., 2010). These researchers have endorsed the call by others for prompt effective treatment of smear-positive TB patients in all health facilities with standard drugs provided the organism is drug-sensitive.

Non-existent or inadequate control measures have been shown to influence the transmission of *Mycobacterium tuberculosis* in developing or resource constrained countries (Naidoo and Jinabhai, 2006, Abdool Karim et al., 2009, Padayatchi et al., 2010). Unlike many other countries in the world such as the United States of America(USA) , South Africa does not have any officially standardised guidelines concerning control of nosocomial infections (Naidoo and Jinabhai, 2006). The implementation of the Centers for Disease Control(CDC) guidelines (published in 1994) had led to a decrease in nosocomial transmission of tuberculosis in the USA (Centers for Disease Control and Prevention). It has been suggested that these guidelines be integrated into the current South African legislation addressing occupationally acquired diseases, and that this should be part of a broader effort to alleviate the current burden of nosocomial tuberculosis among HWCs (Naidoo and Jinabhai, 2006, National Department of Health, 2007).

CHAPTER 3

METHODOLOGY

3.1 Study design

This was a descriptive analytical cross-sectional study with qualitative and quantitative components.

3.2 Study setting

KwaZulu-Natal, South Africa.

3.3 Target Population

Medical doctors working in Kwazulu-Natal, South Africa.

3.4 Study Population

Medical doctors, working in Kwazulu-Natal, who were diagnosed and treated for tuberculosis between 1 January 2007 and 31 December 2010.

3.5 Inclusion/Exclusion Criteria

Inclusion criteria

i. Medical doctors working in Kwazulu-Natal who were diagnosed and treated for tuberculosis from 1 January 2007 to 31 December 2010.
ii. All those above who have been identified and who had given written informed consent to be participants.

Exclusion criteria

Medical doctors working in Kwazulu-Natal diagnosed and treated for tuberculosis before 1 January 2007.

3.6 Sampling methodology

3.6.1 Method of selecting sample

A “snowball method” of sampling was used. Doctors were addressed generally during official professional meetings by doctor groupings. Eligible doctors treated for TB during the study period and who identified themselves via this technique were thereafter contacted telephonically, informed of the nature of the study and the study objectives (using the information document) and were formally invited to participate in the study.

3.6.2 Size of sample

The study sample comprised all doctors recruited consecutively and who agreed to participate in the study. At least 100 participants were initially expected to participate. The consulting biostatistician was not able to calculate a sample size mainly because of the bi-modal study design with quantitative and qualitative components, and also because of the lack of similar studies published in the literature.

3.7 Data sources

3.7.1 Measurement instruments/Data collection Techniques

Data was collected using a semi-structured questionnaire (Annexure A1). The questionnaire was self- designed and was conducted in English. It comprised open

and closed ended questions; each participant was expected to complete the questionnaire within 15 minutes. The questionnaire was first piloted using a sample of five doctors who were infected with tuberculosis prior to 2007; necessary amendments were made thereafter. The modified questionnaires were self-administered by the participants.

3.7.2 Measures to ensure validity

The questionnaires were standardized and applied to every participant in a similar manner.

Participant selection bias was minimised by the informality of the initial approach to all doctors in social or professional meetings, and the recruiting of consecutive doctors identified in this way. Doctors who expressed any reservations about potential stigmatisation and victimisation excluded themselves from the study.

3.7.3 Data collection and handling

Potential participants were contacted telephonically and invited to participate in the study. The researcher arranged an appointment with the participant. The aim and the objectives of the study were explained to the potential participant by the researcher using the patient information sheet. Participants completed the informed consent form.

The researcher then issued the questionnaire to the participant. The questionnaire was self-administered by the participant at his/her convenience. Each participant was requested to place the completed questionnaire into a sealed envelope. These envelopes containing the completed questionnaires were personally collected by

the researcher at a later date that was mutually agreed upon by the researcher and each of the participants.

The completed questionnaires have been kept in a secure place and the information obtained has not been linked to any individual's identity. These questionnaires have been secured by the researcher for a period of five years. There were no identifiers in the questionnaires or envelopes which could have linked them to the participants.

3.8 Plan for Data handling/ processing

All data was captured using the Statistical Software Package for Social Sciences (SPSS version19, IBM Inc. Chicago, Illinois, USA), and was analysed for statistical significance by the consulting biostatisticians (Ms Tonya Esterhuizen and Mr Stephan van der Linde) at the University of KwaZulu-Natal.

The quantitative variables were analyzed using descriptive summary statistics such as mean, standard deviation and range, whilst frequency tables and percentages were used for categorical variables.

3.9 Limitations of the study

Several limitations were recognised as the study progressed and reached finality. These are listed as follows:

i. It was not possible to track all doctors who were infected with tuberculosis in the relevant time period.

ii. Many doctors identified as eligible participants refused to participate in the study for various reasons especially those related to possible stigmatisation.

iii. The use of self- administered questionnaires (viz. drop and pick- up method) in studies is frequently associated with low response rates. Notwithstanding the precautions taken by the researcher to personally collect the completed questionnaire from the participant, a number of participants reneged on their promises and did not meet appointments or comply with the agreed plan. They were therefore excluded from the study.

iv. Self-administered questionnaires also carry an additional risk viz. quality assurance in terms of completion of questionnaires. Since participants placed completed questionnaires in sealed envelopes, the researcher was not able to ascertain if all questions in the questionnaire were fully completed.

3.10 Ethical considerations

The study received ethical approval from the Biomedical Research Ethics Committee (BREC) of the College of Health Sciences, University of KwaZulu-Natal (approval number BF 097/09), and approval from the Post-graduate committee at the Nelson R Mandela School of Medicine (Annexures B 1-2).

Written informed consent was obtained from each participant (Annexure B 3). Each participant was assured of confidentiality and security of all data collected.

All collected and analysed data have been stored in a safe by the researcher, and anonymity of the participants has been respected.

CHAPTER 4

RESULTS

The results are presented as follows:

i. socio-demographic profile of participants
ii. clinical presentations of participants, investigations and time to diagnosis
iii. iatrogenic side-effects and complications following procedures
iv. perceptions and reflections of overall experiences of participants

4.1 Socio-demographic profile of participants

Sixty two medical doctors were identified as being eligible to participate in the study. However, only 40 questionnaires were returned for analysis. The socio-demographic characteristics of these participants are presented in Table1.

Table 1: Demographic profile of participants

Variable	Male		Female		Total	
	n	%	n	%	n	%
Number of participants	21	52.5	19	47.5	40	100
Age (years) groups:						
21 – 30	10	47.6	11	57.9	21	52.5
31 – 40	7	33.3	6	31.5	13	32.5
41 – 50	0	0	1	5.3	1	2.5
51 – 60	3	14.3	0	0	3	7.5
61 – 67	1	4.8	1	5.3	2	5
Race:						
Black	3	14.3	0	0	3	7.5
Indian	17	81.0	17	89.4	34	85
Whites	1	4.7	2	10.5	3	7.5
Employment:						
Public	20	95.2	18	94.7	38	95
Private	1	4.8	1	5.2	2	5
Employment Public sector:						
Primary Healthcare	0	0	1	5.6	1	2.6
District level	6	30.0	4	22.2	10	26.3
Regional level	5	25.0	8	44.4	13	34.2
Quaternary level	9	45.0	5	27.8	14	36.9
Still on anti-TB treatment	4	19.1	6	31.6	10	25.0
Discipline worked - 1 month prior:						
Medical	16	76.2	13	68.4	29	72.5
Surgical	4	19.0	4	21.1	8	20.0
Other : GP	0	0	1	5.3	1	2.5
Missing information	1	4.8	1	5.2	2	5.0
Discipline worked - at time of diagnosis						
Medical	16	76.2	10	52.7	26	65.0
Surgical	4	19.1	7	36.9	11	17.5
Other : GP	0	0	1	5.2	1	2.5
Missing information	1	4.7	1	5.2	2	5

The majority of the participants were of Indian descent (n=34; 85%), in the younger age group viz. 21-40 years (n=34; 85%), male (n=21; 52.5%), and employed in the public sector (n=38; 95%). Two (5%) participants were employed in either private hospitals or general practice. Twenty seven doctors (67.5%) were employed in specialist designated regional or tertiary public hospitals in KwaZulu-Natal; the remainder (n=10; 27.5%) worked in primary care (level 1) facilities. Most of the participants (>70%) worked in medical disciplines one month prior to developing the

initial symptoms of their illness. Only two of the participants worked either in a TB clinic or TB in-patient ward. There were no statistical differences between male and female participants in any of the various categories shown in Table 1.

4.2 Clinical presentations and investigations

The symptoms and signs were grouped into two categories i.e. those that are generally accepted as common findings associated with tuberculosis infection, and those that are not are not commonly documented in the literature (Table 2). Malaise was reported to be the most common presenting symptom in 22 (55%) of all participants. Night sweats (n=21; 52.5%) and unexplained weight loss (n=22; 55%) were also highly ranked. More males reported these symptoms when compared to their female counterparts in the study sample. Only 4 participants reported fever as a presenting symptom. Other common symptoms were chronic cough (n=19), pleuritic chest pain (n=14), lymphadenopathy (n=12) and dyspnoea (n=8). Less common and unusual presentations that were reported included odynophagia, skin lesions, hepatomegaly, meningism and neuropathy (n=8).

Table 2: Clinical presentations at baseline

	Males		Females		Total (N)
Symptom	**n**	**%**	**n**	**%**	
Chest pain	**8**	**38.1**	**6**	**31.5**	**14**
Cough	**11**	**52.3**	**8**	**42.1**	**19**
Fever	**1**	**4.7**	**8**	**42.1**	**9**
Headache	**2**	**9.5**	**4**	**21.0**	**6**
Lymph nodes	**4**	**19.0**	**8**	**42.1**	**12**
Loss of weight	**11**	**52.3**	**9**	**47.3**	**20**
Malaise	**14**	**66.6**	**8**	**42.1**	**22**
Night sweats	**13**	**61.9**	**8**	**42.1**	**21**
Shortness of breath	**3**	**14.2**	**5**	**26.3**	**8**
Other	**2**	**9.5**	**9**	**47.3**	**11**

The investigations performed at initial presentation are listed in Table 3. An analysis of the commonly done investigations which are part of the national standard of care shows that sputum microscopy was requested in 70% (n=28) of the participants, and chest radiographs were performed in 38 (95%) of all participants.

Other investigations or diagnostic procedures that were performed on some of the participants included the following: upper endoscopy in one participant who presented with dysphagia, bronchoscopy in 2 participants and mediastinoscopy in 1 participant. Fifteen participants (37.5%) underwent chest cat scans during the diagnostic period. One participant had consulted a rheumatologist because of persistent arthralgia whilst on treatment, and was subjected to an MRI full body scan, bone scan and several haematological investigations.

Table 3: Initial investigations and complications

Investigations	Participants	
	n	%
Chest x-ray	38	95.0
Sputum:		
Microscopy	28	70.0
Culture	23	57.5
Sensitivity	17	42.5
CT Scan (chest)	15	37.5
Tissue biopsy: microscopy	14	35.0
Culture	9	22.5
Pleural fluid chemistry	8	20.0
Pleural fluid microscopy	7	17.5
Pleural fluid culture	7	17.5
Quantiferon Gold in-tube test	3	7.5
Other investigations	8	20.0
Complications as a result of procedures conducted	8	20.0

Eight (20%) doctors reported complications that had developed as a result of procedures conducted on them. These complications included the following: haemoptysis and pleuritic chest pain following bronchoscopy; cellulitis at biopsy site of lesion; development of a chest wall abscess at biopsy site; a chronic draining sinus from lymph node biopsy site; and injury to the participant's neurovascular bundle on insertion of an intercostal chest drain and performing a pleural biopsy.

An analysis of lag time from onset of symptoms to definitive diagnosis (Table 4) showed that only 23.8% of males and 15.8% of female participants were diagnosed definitively within one week of developing symptoms.

Table 4: Analysis of lag time from symptoms to diagnosis

Time (days)	Males (n=21)		Females (n=19)	
	n	%	n	%
<8	5	23.8	3	15.8
8 - 21	6	28.6	5	26.3
>21	10	47.6	11	57.9

There were no statistically significant differences between male and female participants for this variable. A total of 32 participants were diagnosed beyond day 21.Thirty five percent (n=14) of all participants thought that the delays in diagnosis were inappropriate. Further analysis of this finding showed that five participants (12.5%) felt that the delay in diagnosis was due to delayed and inappropriate help-seeking behaviour; eight participants (20%) felt that their care giver had either delayed or omitted to investigate them earlier, and two participants felt that they were wrongly diagnosed.

4.4 Iatrogenic side-effects of prescribed medications and complications following procedures

Table 5 lists the side effects experienced by the participants during their treatment phase. A total of 84 iatrogenic side-effects were reported by 33 (82.5%) participants. These were mainly abdominal pain and symptoms of gastritis in 10 participants (25%); nine (22.5%) had continuing malaise while on treatment, peripheral neuropathy (n=7; 17.5%), skin rashes (n=7; 17.5%), new onset arthralgia (n= 5; 12.5%), toxic hepatitis (n=3; 7.5%) and photophobia (n=2; 5%). Of the 21

(52.5%) participants who complained of nausea and vomiting, 12 (63.1%) were females and 9 (42.8%) were males.

Nine participants who developed symptoms following tuberculosis treatment self-medicated with homeopathic medicines and complimentary therapy in an attempt to alleviate these symptoms while on concurrent anti-tuberculosis therapy.

Table 5: Side effects of prescribed medications

	Males		Females	
Side effect	**(n)**	**(%)**	**(n)**	**(%)**
Abdominal pain	**1**	**4.7**	**9**	**47.3**
Arthralgia	**2**	**9.5**	**3**	**15.7**
Diarrhoea	**1**	**4.7**	**4**	**21.0**
Dizziness	**1**	**4.7**	**0**	**0**
Drowsiness	**0**	**0**	**3**	**15.7**
Gout	**0**	**0**	**1**	**5.2**
Headache	**0**	**0**	**1**	**5.2**
Hepatitis	**2**	**9.5**	**1**	**5.2**
Insomnia	**1**	**4.7**	**1**	**5.2**
Malaise	**3**	**14.2**	**6**	**31.5**
Metallic taste	**1**	**4.7**	**1**	**5.26**
Myopathy	**1**	**4.7**	**1**	**5.26**
Nausea, vomiting	**9**	**42.8**	**12**	**63.1**
Peripheral neuropathy	**3**	**14.2**	**4**	**21.0**
Photophobia	**0**	**0**	**2**	**10.5**
Skin rash	**3**	**14.2**	**4**	**21.0**

4.5 Perceptions following diagnosis and treatment

All participants provided reflective responses to leading statements; these were related to their experiences during the phases of diagnosis, treatment and management following the contraction of nosocomial tuberculosis. These are listed in Table 6.

Table 6: Perceptions of participants relative to experiences

Statement	Strongly Disagree (n)	Disagree (n)	Neutral (n)	Agree (n)	Strongly Agree (n)
Found period of treatment difficult to endure	**4**	**4**	**5**	**20**	**7**
Considered defaulting on pharmacotherapy	**17**	**9**	**1**	**10**	**3**
I modified my pharmacotherapy to suit my personal needs	**14**	**15**	**-**	**10**	**1**
Medical doctors are more likely to have access to specialized diagnostics procedures compared to rest of population	**1**	**8**	**1**	**18**	**12**
Medical doctors are given preferential medical treatment	**2**	**11**	**9**	**14**	**4**
Personal experience has changed my approach to patients	**0**	**1**	**3**	**24**	**12**

A number of participants felt that medical doctors received preferential consideration for specialized diagnostic procedures (n=30; 75%) and generally received preferential treatment (n=18; 45%), compared to the rest of the population. The majority of participants (n=36; 90%) reflected that their personal experiences as patients with tuberculosis influenced them to modify their attitudes and clinical approaches to their current patients. Whilst the majority of the participants admitted that their own experiences have re-moulded them towards becoming more empathic doctors, a minority (n=4) preferred to be non-committal on this issue. Additional reflections focussed on further risk minimisation, future career changes and attitudes towards patients and the public health system. For example, one

doctor had since left clinical medicine and found employment either in a laboratory facility without patient contact, for fear of placing herself at further risk. She regretted her decision to practise medicine. Another doctor expressed similar feelings and listed specific events during his illness of how inappropriately he was treated by his fellow colleagues at work. He mentioned that he was criticised for taking sick leave and was forced to cover up hours that he missed as soon as he returned to work. This sentiment was echoed in several other responses as some senior medical colleagues felt that sick leave was a privilege and not an entitlement. In addition, he reported that his confidentiality was not maintained. He felt so bitter about his experience that he too has sought employment in a field with no patient contact.

One participant felt “angry” when having to treat patients who were infected with TB and HIV. He admitted to feelings of resent toward them as he felt they were in part “responsible” for him becoming infected.

“Having TB has been one of the most debilitating experiences of my life,” expressed one of the participants. Another participant lamented the attitudes of other colleagues and said, “Our task as doctors is to assist with healing others. It hurts when our own well-being is jeopardized through an illness (that we have contracted in trying to provide a service to others), and our colleagues and management show an uncaring attitude towards us!”

Only two of the 40 participants were aware of the current national regulations for compensation of tuberculosis infection in South Africa according to the Compensation for Occupational Injuries and Diseases Act (COIDA). One participant had submitted the relevant forms and was still awaiting a response from COIDA.

CHAPTER 5

DISCUSSION AND CONCLUSION

This chapter presents a discussion of the main findings, limitations of the study, implications and conclusions linked to the study. The discussion on the main findings will follow a similar sequence to the presentation of the results in the previous chapter.

5.1 Socio-demographic profile of participants

In this study, the majority of participants were in the younger age group and employed within medical departments in the public health care system, either immediately before or during presentation with symptoms or signs of TB. This is not surprising considering that the majority of patients with TB generally access these medical departments in hospitals first for their help-seeking needs, thereby acting as vectors in the transmission of infection. Doctors and nurses are generally the primary care givers in general medical wards and outpatient facilities. Similar findings have been made in other studies (Wilkinson and Gilks, 1998, Joshi et al., 2006, Naidoo and Jinabhai, 2006, O' Donnell et al., 2010, Padayatchi et al., 2010). Occupational exposure towards TB constitutes a major health hazard for all health care workers throughout the world, and particularly in developing and resource-constrained countries or settings (Joshi et al., 2006). This risk is increased in settings with a high burden of communicable diseases such as HIV and TB including varying forms of drug resistant TB and lack of adequate infection control measures (Wilkinson and Gilks, 1998, Naidoo and Jinabhai, 2006, Joshi et al., 2006, O' Donnell et al., 2010, Padayatchi et al., 2010). Workers in TB inpatient facilities, medical wards and outpatient medical facilities have been shown to be at higher risk for TB disease compared to the general population(Joshi et al., 2006).

Increasing age and duration of employment in the healthcare facility (indicating longer cumulative exposure to TB) were associated with a higher prevalence of TB(Joshi et al., 2006). The majority of participants in our study worked in similar settings with a high burden of TB and HIV, and were therefore placed at greater risk than other categories of healthcare staff.

5.2 Clinical Presentation, Help-seeking behaviour and Management of Participants

Our study found a large number of doctors had not taken seriously the cluster of symptoms generally accepted as being suggestive of tuberculosis infection, thus delaying their diagnosis and definitive treatment. One would have expected that all medical doctors (aware of the current burden of infectious disease) would be prompted by a higher index of suspicion to immediately investigate their own symptoms of cough, night sweats, etc. All of the participants in this study were HIV uninfected, and the majority presented with non-specific symptoms and signs. Health care workers may therefore understandably find it difficult to differentiate these non-specific symptoms from work-related fatigue or other mild illnesses, if one considers the current context of working in a resource constrained working environment in the public health care system in South Africa which is additionally burdened by increasing numbers of immune-compromised patients. For example, as one participant stated, “I neglected the symptoms due to the pressures of work…stress, physical exhaustion, 10-12 calls per month, sleep deprivation and inappropriate diet”. It has been suggested that “many doctors may be reluctant to admit that they are ill and may be especially unwilling to acknowledge that their ill health is affecting their performance at work”. Additionally, doctors may experience

high levels of shame associated with being ill, and this may influence delays in seeking help (Sexton et al., 2001).

Many studies have been carried among the general populations towards their experience of contracting TB. Denials by patients of having contracted or suffering from tuberculosis has been an ongoing problem (Rowe et al., 2005, Jakubowiak et al., 2008, Karim et al., 2011). Tuberculosis related stigma has been shown to worsen the quality of life of patients with consequential effect on health or even help care-seeking behaviour (Somma et al., 2008, Weiss et al., 2008). Certain types of social consequences (unemployment, homelessness, imprisonment or poverty) and psychological effects (low morale, depressed mood, mood swings and having little confidence in medical staff) could account for the poor adherence to treatment or even inappropriate help-seeking behaviour (Jakubowiak et al., 2008, Shin et al., 2008). Another study found that patients were not adequately educated about the cause of TB, and those who were diagnosed felt embarrassed about contracting the disease. In addition, the negative attitudes of certain health care staff discouraged them from seeking treatment earlier (Rundi, 2010).

One would have expected tests such as chest x-rays and sputum analysis to have been conducted in all these subjects as part of the standard care of practice in the national health care system (National Department of Health, 2007). However, this did not occur in all participants. It is possible that participants who could not produce sputum were sent for alternate tests. Additionally, because these tests were found to be negative in the majority of participants, their care-givers opted for a variety of costly investigations such as Quantiferon Gold in-tube test, chest cat scans (33.5%), bronchoscopy, mediastinoscopy, etc., which are not normally available to the general public for similar presentations. The Quantiferon Gold in-

tube test has been found to have a low sensitivity in the diagnosis of active TB (Legesse et al., 2010). Perhaps, awareness of the high prevalence of extra-pulmonary disease especially in immuno-compromised patients in the general population, and the risk of nosocomial infections may have influenced care givers of these participants to opt for these procedures. Many participants gained access to specialized procedures for diagnosis of TB, which are usually reserved for exceptional cases. A number of participants in this study concurred that medical doctors are generally given preferential treatment by their colleagues and are more likely to access specialized levels of care than the general population, and that the search for a diagnosis is amplified when the patient is a medical doctor.

5.3 Perceptions and reflections following TB treatment

Strict adherence to anti-TB therapy forms the cornerstone of the nationally accepted clinical guideline in TB management (National Department of Health, 2007). All clinicians spend most of their clinical time counselling patients on this most important aspect of clinical care. It is therefore disconcerting that a large number of participants displayed varying responses and attitudes to relevant statements relating to adherence. Thirteen (32.5%) participants in this study considered defaulting their treatment and a further 11(27.5%) had modified their therapy to suit their personal needs. Twenty seven (67.5%) participants admitted to difficulty in enduring their treatment. These responses may have been influenced by side effects commonly associated with prescribed anti-TB drugs, and by concomitant high stress levels including varying levels of depression. Similar and additional risk factors for defaulting treatment were identified among a cohort of elderly patients suffering with depression in Malaysia (Rashid and Rahmah, 2010). Among the risk factors identified with the default of drug treatment in this study

included side effects from medicines, not being given a choice to choose the treating doctor, and not being happy with the prescribed treatment. Additionally, long waiting times and varying problems with the health facility were considered potential risk factors.

The current South African national guidelines mention that those with increased risk of developing drug-induced hepatitis are patients with chronic infectious hepatitis, patients with pre-existing liver disease, patients with high levels of alcohol consumption, females, HIV infected patients and patients who are receiving other hepatotoxic drugs as well as those patients older than 35 years of age. In our study, only five participants were found to have concurrent co-morbid lifestyle illnesses such as Diabetes mellitus, Asthma, etc., but none had any of the illnesses mentioned above which could have placed them at risk.

Twenty-two (55%) of all participants described gastro-intestinal side-effects such as nausea, vomiting, etc.; these could have been due to any of the constituent drugs present in the combination drug formulations currently in use as first line drugs. Seven patients (17.5%) in the study were diagnosed with peripheral neuropathy; these could have been due to either isoniazid and / or ethambutol which are part of the standard regimen of drugs used.

One of the participants in this study had persistent arthralgia which necessitated self-referral to a rheumatologist. Pyrazinamide and ethambutol are commonly associated with hyperuricaemia and arthralgia; this is usually self-limiting and rarely requires discontinuation of therapy.

The study also produced a refreshingly positive finding, in that the majority of subjects were influenced and humbled by their own experiences as patients to such an extent that they had decided to modify their own approach to patients in future. Thirty six participants (90%) had already decided that they would become more patient-centred and improve the doctor-patient relationship in future consultations; however, a minority of subjects felt the high burden of disease and increased burden of care by a limited and constrained medical workforce militated against a change in professional behaviour towards patients. Similar findings have reported in other studies, where medical doctors felt their personal experiences helped them empathise and communicate with patients (Kern et al., 2001, Woolf et al., 2007). It is believed that personal experience of illness may improve doctors' empathy, patient-centredness and professional behaviour, possibly via reflection and transformational learning processes (Woolf et al., 2007).

5.4 Nosocomial TB and COIDA

This study did not explore the source of TB contraction in the participants, and therefore cannot confirm that all participants had nosocomial TB. Considering the context of the work environments of all participants and the high burden of communicable infectious diseases in these settings, it is possible that all participants either had nosocomial infection or reactivation of pre-existing TB.

Nosocomial tuberculosis has been gazetted a compensatable disease by the Compensation for Occupational Injuries and Diseases Act in South Africa. Only two subjects in the study were aware of this, and one of them is still awaiting a written response to a claim despite many requests. Another has been informed that COIDA would not compensate any medical doctor for extra-pulmonary TB, and where the

cause has not been verified as nosocomial. This response appears to be similar to other anecdotal experiences by other medical doctors outside this study. Increased advocacy by the medical profession may influence a policy change and swift response to enquiries in this regard.

5.5 Limitations of the study

This study had several limitations. The study sample was small and therefore precluded a more extensive quantitative analysis for statistical differences and significance of some of the parameters studied. Many eligible participants (n=22) cited stigmatization in social and professional circles as well as victimization at the place of employment and therefore decided to withdraw their initial intention to participate. Only a minority of doctors (30.8%) from the primary health care sector of the public health care system volunteered to participate. This may not be representative of the true picture when matched against the current prevailing background of a large burden of disease in primary care. The “snow-ball” method of sampling has inherent biases. The results of this study cannot be generalized to the broader population of medical doctors because of the limitations in the study design, subject recruitment and sample size. A broader more extensive study is therefore recommended.

5.2 Implications of Study and Conclusion

This study has confirmed previous published reports that TB among medical doctors is a serious personal, professional and public health issue, and endorses the view that it must be addressed more vigorously by both policy makers and by the medical profession (Colvin et al., 2001, Naidoo and Jinabhai, 2006, Padayatchi et al., 2010).

Suitable infection control measures, effective screening, early diagnosis, proper treatment and management of TB infection in HCWs, particularly doctors and nurses who come into close contact with TB patients and education of HCWs about TB, have been shown to be effective in reducing the incidence and prevalence of TB in this vulnerable group (Centers for Disease Control and Prevention, Torres Costa et al., 2010). Perhaps, the introduction of a screening programme similar to that carried out in Portugal may produce a similar outcome of decreasing the incidence of TB in health care workers (Torres Costa et al., 2010). Additionally, transmission control measures recommended by the Centers for Disease Prevention (2005) should be integrated and implemented into the South African guidelines for the management of TB.

Pre-employment screening of all HCWs for TB and regular surveillance of HCWs within an employee assistance programme in all health facilities are strongly recommended. If implemented and standardized throughout South Africa, this infection control programme is expected to impact positively on early detection and rapid treatment of HCWs with nosocomial TB. It will also help to differentiate between nosocomial transmission of TB and reactivation of pre-existing disease, and facilitate rapid resolution of problematic case enquiries by COIDA.

The risk of drug resistance and the emergence of new resistant strains of Mycobacterium tuberculosis further emphasises the need for these measures to be standardized in order to minimise the transmission of tuberculosis within health facilities.

Senior medical colleagues and hospital management in all health care facilities are advised to adopt a more caring and compassionate approach towards medical doctors infected and affected by TB.

REFERENCES

Abdool Karim, S. S., Churchyard, G., Abdool Karim, Q. & Lawn, S. D. 2009. HIV infection and tuberculosis in South Africa: an urgent need to escalate the public health response. *The Lancet***,** 41-53.

Alonso-Echanove, J., Granich, R. M., Laszlo, A., Chu, G., Borja, N., Blas, R., Olortegui, A., Binkin, N. J. & Jarvis, W. R. 2001. Occupational transmission of Mycobacterium tuberculosis to health care workers in a university hospital in Lima, Peru. *Clin Infect Dis,* 33**,** 589-96.

Armijos, R. X., Weigel, M. M., Qincha, M. & Ulloa, B. 2008. The meaning and consequences of tuberculosis for an at-risk urban group in Ecuador. *Revista panamericana de salud publica = Pan American journal of public health,* 23**,** 188-97.

Atun, R. A., Samyshkin, Y. A., Drobniewski, F., Skuratova, N. M., Gusarova, G., Kuznetsov, S. I., Fedorin, I. M. & Coker, R. J. 2005. Barriers to sustainable tuberculosis control in the Russian Federation health system. *Bull World Health Organ,* 83**,** 217-23.

Bonifacio, N., Saito, M., Gilman, R. H., Leung, F., Cordova Chavez, N., Chacaltana Huarcaya, J. & Vera Quispe, C. 2002. High risk for tuberculosis in hospital physicians, Peru. *Emerg Infect Dis,* 8**,** 747-8.

Centers for Disease Control and Prevention Guidelines for preventing the transmission of Mycobacterium tuberculosis in health care facilities, 2005. *In:* Jensen, P. A., Lambert, L. A., Lademarco, M. F. & R, R. (eds.).

Colvin, M., Dawood, S., Kleinschmidt, I., Mullick, S. & Lallo, U. 2001. Prevalence of HIV and HIV-related diseases in the adult medical wards of a tertiary hospital in Durban, South Africa. *Int J STD AIDS,* 12**,** 386-9.

Deribew, A., Tesfaye, M., Hailmichael, Y., Negussu, N., Daba, S., Wogi, A., Belachew, T., Apers, L. & Colebunders, R. 2009. Tuberculosis and HIV co-infection: its impact on quality of life. *Health and quality of life outcomes,* 7**,** 105.

Dhuria, M., Sharma, N., Narender Pal, S., Ram Chander, J., Saha, R. & Gopal Krishan, I. 2009. A study of the impact of tuberculosis on the quality of life and the effect after treatment with DOTS. *Asia-Pacific journal of public health / Asia-Pacific Academic Consortium for Public Health,* 21**,** 312-20.

Dimitrova, B., Hutchings, A., Atun, R., Drobniewski, F., Marchenko, G., Zakharova, S., Fedorin, I. & Coker, R. J. 2005. Increased risk of tuberculosis among health care workers in Samara Oblast, Russia: analysis of notification data. *Int J Tuberc Lung Dis,* 9**,** 43-8.

Fry, R. S., Khoshnood, K., Vdovichenko, E., Granskaya, J., Sazhin, V., Shpakovskaya, L., Zhemkov, V., Zhemkova, M., Rowhani-Rahbar, A., Funk, M. & Kozlov, A. 2005. Barriers to completion of tuberculosis treatment among prisoners and former prisoners in St. Petersburg, Russia. *Int J Tuberc Lung Dis,* 9**,** 1027-33.

Galgalo, T., Dalal, S., Cain, K. P., Oeltmann, J., Tetteh, C., Kamau, J. G., Njenga, M. K., Breiman, R. F., Chakaya, J. M., Irimu, H. M., Miller, B., De Cock, K. M., Bock, N. N. & Ijaz, K. 2008. Tuberculosis risk among staff of a large public hospital in Kenya. *Int J Tuberc Lung Dis,* 12**,** 949-54.

Hansel, N. N., Wu, A. W., Chang, B. & Diette, G. B. 2004. Quality of life in tuberculosis: patient and provider perspectives. *Quality of life research : an international journal of quality of life aspects of treatment, care and rehabilitation,* 13**,** 639-52.

Harries, A. D., Hargreaves, N. J., Gausi, F., Kwanjana, J. H. & Salaniponi, F. M. 2002. High death rates in health care workers and teachers in Malawi. *Trans R Soc Trop Med Hyg,* 96**,** 34-7.

Harries, A. D., Kamenya, A., Namarika, D., Msolomba, I. W., Salaniponi, F. M., Nyangulu, D. S. & Nunn, P. 1997. Delays in diagnosis and treatment of smear-positive tuberculosis and the incidence of tuberculosis in hospital nurses in Blantyre, Malawi. *Trans R Soc Trop Med Hyg,* 91**,** 15-7.

Harries, A. D., Nyirenda, T. E., Banerjee, A., Boeree, M. J. & Salaniponi, F. M. 1999. Tuberculosis in health care workers in Malawi. *Trans R Soc Trop Med Hyg,* 93**,** 32-5.

Jakubowiak, W. M., Bogorodskaya, E. M., Borisov, S. E., Danilova, I. D., Lomakina, O. B. & Kourbatova, E. V. 2008. Impact of socio-psychological factors on treatment adherence of TB patients in Russia. *Tuberculosis (Edinburgh, Scotland),* 88**,** 495-502.

Joshi, R., Reingold, A. L., Menzies, D. & Pai, M. 2006. Tuberculosis among Health-Care Workers in Low- and Middle-Income Countries: A Systematic Review. *PloS Medicine,* 3**,** 2376-2391.

Kanyerere, H. S. & Salaniponi, F. M. 2003. Tuberculosis in health care workers in a central hospital in Malawi. *Int J Tuberc Lung Dis,* 7**,** 489-92.

Karim, F., Johansson, E., Diwan, V. K. & Kulane, A. 2011. Community perceptions of tuberculosis: A qualitative exploration from a gender perspective. *Public Health,* 125**,** 84-9.

Kern, D. E., Write, S. M. & Carrese, J. A. 2001. Personal growth in medical faculty: a qualitative study. *West J Med,* 175**,** 92-98.

Kruuner, A., Danilovitsh, M., Pehme, L., Laisaar, T., Hoffner, S. E. & Katila, M. L. 2001. Tuberculosis as an occupational hazard for health care workers in Estonia. *Int J Tuberc Lung Dis,* 5**,** 170-6.

Laniado-Laborin, R. & Cabrales-Vargas, N. 2006. Tuberculosis in healthcare workers at a general hospital in Mexico. *Infect Control Hosp Epidemiol,* 27**,** 449-52.

Legesse, M., Ameni, G., Mamo, G., Medhin, G., Bjune, G. & Adebe, F. 2010. Performance of QuantiFERON-TB Gold In-Tube (QFTGIT) for the diagnosis of Mycobacterium tuberculosis (Mtb) infection in Afar Pastoralists, Ethiopia. *BMC Infectious Diseases,* 10.

Menzies, D., Fanning, A., Yuan, L. & Fitzgerald, M. 1995. Tuberculosis among health care workers. *N Engl J Med,* 332**,** 92-8.

Naidoo, S. & Jinabhai, C. C. 2006. TB in health care workers in KwaZulu-Natal, South Africa. *Int J Tuberc Lung Dis,* 10**,** 676-82.

National Department of Health 2007. The South African Tuberculosis Control Programme. Practical Guidelines. Pretoria, South Africa.

Ngamvithayapong, J., Winkvist, A. & Diwan, V. 2000. High AIDS awareness may cause tuberculosis patient delay: results from an HIV epidemic area, Thailand. *AIDS,* 14**,** 1413-9.

O' Donnell, M. R., Jarand, J., Loveday, M., Padayatchi, N., Zelnick, J., Werner, L., Naidoo, K., Master, I., Osburn, G., Kvasnovsky, C., Shean, K., Pai, M., Van der Walt, M., Horsburgh, C. R. & Dheda, K. 2010. High Incidence of Hospital Admissions with Multidrug Resistant and Extensively Drug Resistant Tuberculosis among South African Health Care Workers. *Ann Intern Med,* 153**,** 516-522.

Padayatchi, N., Daftary, A., Moodley, T., Madansein, R. & Ramjee, A. 2010. Case series of the long-term psychosocial impact of drug-resistant tuberculosis in HIV-negative medical doctors. *Int J Tuberc Lung Dis,* 14**,** 960-6.

Plitt, S. S., Soskolne, C. L., Fanning, E. A. & Newman, S. C. 2001. Prevalence and determinants of tuberculin reactivity among physicians in Edmonton, Canada: 1996-1997. *Int J Epidemiol,* 30**,** 1022-8.

Ramphal-Naley, L., Kirkhorn, S., Lohman, W. H. & Zelterman, D. 1996. Tuberculosis in physicians: compliance with surveillance and treatment. *Am J Infect Control,* 24**,** 243-53.

Rao, K. G., Aggarwal, A. N. & Behera, D. 2004. Tuberculosis among physicians in training. *Int J Tuberc Lung Dis,* 8**,** 1392-1394.

Rashid, A. K. & Rahmah, M. A. 2010. Treatment Related Risk Factors Associated with the Default of Depression Treatment Among the Elderly- A Case Control Study. *The Open Geriatric Medicine Journal,* 3**,** 11-16.

Rowe, K. A., Makhubele, B., Hargreaves, J. R., Porter, J. D., Hausler, H. P. & Pronyk, P. M. 2005. Adherence to TB preventive therapy for HIV-positive patients in rural South Africa: implications for antiretroviral delivery in resource-poor settings? *Int J Tuberc Lung Dis,* 9**,** 263-9.

Rundi, C. 2010. Understanding Tuberculosis: Perspectives and Experiences of the People of Sabah, East Malaysia. *Journal of Health Population and Nutrition,* 28**,** 114-123.

Sexton, J., Thomas, E. & Helmreich, R. 2001. Error, stress and teamwork in medicine and aviation: cross sectional surveys. *Journal of Human Performance in Extreme Environments,* 6**,** 6-11.

Shin, S., Munoz, M., Espiritu, B., Zeladita, J., Sanchez, E., Callacna, M., Rojas, C., Arevalo, J., Wu, Y., Caldas, A. & Sebastian, J. L. 2008. Psychosocial impact of poverty on antiretroviral nonadherence among HIV-TB coinfected patients in Lima, Peru. *Journal of the International Association of Physicians in AIDS Care (Chicago, Ill : 2002),* 7**,** 74-81.

Somma, D., Thomas, B. E., Karim, F., Kemp, J., Arias, N., Auer, C., Gosoniu, G. D., Abouihia, A. & Weiss, M. G. 2008. Gender and socio-cultural determinants of TB-related stigma in Bangladesh, India, Malawi and Colombia. *Int J Tuberc Lung Dis,* 12**,** 856-66.

Suleiman, B. A., Houssein, A. I., Mehta, F. & Hinderaker, S. G. 2003. Do doctors in north-western Somalia follow the national guidelines for tuberculosis management? *East Mediterr Health J,* 9**,** 789-95.

Torres Costa, J., Silva, R., Sa, R., Cardoso, M. J. & Nienhaus, A. 2010. Results of five-year systematic screening for latent tuberculosis infection in healthcare workers in Portugal. *J Occup Med Toxicol,* 5**,** 22.

Weiss, M. G., Somma, D., Karim, F., Abouihia, A., Auer, C., Kemp, J. & Jawahar, M. S. 2008. Cultural epidemiology of TB with reference to gender in Bangladesh, India and Malawi. *Int J Tuberc Lung Dis,* 12**,** 837-47.

Wilkinson, D. & Gilks, C. F. 1998. Increasing frequency of tuberculosis among staff in a South African district hospital: impact of the HIV epidemic on the supply side of health care. *Trans R Soc Trop Med Hyg,* 92**,** 500-2.

Woolf, K., Cave, J., McManus, C. & Dacre, J. E. 2007. "It gives you an understanding you can't get from any book." The relationship between medical students' and doctors' personal illness experiences and their performance : a qualitative and quantitative study. *BMC Medical Education,* 7.

World Health Organisation 2005. WHO Report 2005: Global Tuberculosis Control. Geneva, Switzerland.

Yanai, H., Limpakarnjanarat, K., Uthaivoravit, W., Mastro, T. D., Mori, T. & Tappero, J. W. 2003. Risk of Mycobacterium tuberculosis infection and disease among health care workers, Chiang Rai, Thailand. *Int J Tuberc Lung Dis,* 7**,** 36-45.

Zhang, S.-R., Yan, H., Zhang, J.-J., Zhang, T.-H., Li, X.-H. & Zhang, Y.-P. 2010. The experience of college students with pulmonary tuberculosis in Shaanxi, China: a qualitative study. *BMC infectious diseases,* 10**,** 174.

ANNEXURES

ANNEXURE A 1

QUESTIONNAIRES: All questionnaires must be submitted with this form

TUBERCULOSIS IN MEDICAL DOCTORS IN KWA-ZULU NATAL (S.A.): EXPERIENCES AND PERCEPTIONS TOWARDS DIAGNOSIS AND TREATMENT

SECTION A: DEMOGRAPHIC INFORMATION

Q1. AGE ☐ years

Q2. SEX ☐ MALE ☐ FEMALE

Q3. RACE ☐ BLACK ☐ INDIAN

☐ WHITE ☐ COLOURED

Q4. EMPLOYED IN ☐ PRIMARY HEALTH CARE CLINIC

☐ DISTRICT LEVEL FACILITY

☐ REGIONAL LEVEL FACILITY

☐ SUPER-SPECIALIST FACILITY

Q5. I WAS WORKING IN……

	A MONTH PRIOR TO DIAGNOSIS	AT THE TIME OF MY DIAGNOSIS
CLINICAL DISCIPLINE		
OPD/ INPATIENT WARD		

Q6. HAVE YOU BEEN DIAGNOSED WITH ANY OTHER CHRONIC MEDICAL CONDITIONS?

☐ YES ☐ NO

Q7. IF YES TO Q6, PLEASE INDICATE

☐ DIABETES ☐ HYPERTENSION

☐ ISCHAEMIC HEART DISEASE ☐ ASTHMA

☐ EPILEPSY ☐ OTHER

IF OTHER, PLEASE SPECIFY _____

_____

Q6. WHEN DID YOU DEVELOP SYMPTOMS OR SIGNS SUGGESTIVE OF TUBERCULOSIS? (Month and year)

_____

Q7. ARE YOU CURRENTLY ON ANY ANTI-TB TREATMENT? (Tick relevant answer)

☐ YES

☐ NO

SECTION B: SYMPTOMS AT ONSET OF ILLNESS

Q8. LIST SYMPTOMS OF ONSET OF ILLNESS

CHRONIC COUGH	☐	ABDOMINAL PAIN	☐
PLEURITIC CHEST PAIN	☐	HEADACHE	☐
DYSPNOEA	☐	SWOLLEN LYMPH NODES	☐
LOSS OF WEIGHT	☐	NIGHTSWEATS	☐
GENERALIZED MALAISE	☐	OTHER	☐

IF OTHER, PLEASE SPECIFY _____

_____

SECTION C: CLINICAL SIGNS AT TIME OF PRESENTATION

Q9. LIST CLINICAL SIGNS AT TIME OF PRESENTATION

CHEST (e.g. pleural effusion, pneumonia etc)

_____

_____

CVS (e.g. pericardial effusion etc)

_____

_____

ABD (e.g. focal lesions in liver, spleen; intra-abdominal lymph nodes; ascites; etc)

_____

_____

CNS
(e.g. meningism; focal neurological deficit; space occupying intracranial lesion; etc)

_____

_____

LYMPHADENOPATHY

_____

_____

OTHER _____

_____

SECTION D: INVESTIGATIONS

Q10. INDICATE THE INVESTIGATIONS CARRIED OUT ON YOU AT INITIAL TIME OF PRESENTATION OF YOUR SYMPTOMS.

INDICATE BRIEF FINDINGS OF TESTS DONE ON YOU BEFORE YOU WERE DIAGNOSED WITH TUBERCULOSIS.

(Tick relevant answers)

SPUTUM MICROSCOPY ☐

SPUTUM CULTURE ☐

SPUTUM SENSITIVITY ☐

TISSUE BIOPSY MICROSCOPY ☐

TISSUE BIOPSY CULTURE ☐

LUMBAR PUNCURE CSF CHEMISTRY ☐

CSF MICROSCOPY ☐

CSF CULTURE ☐

PLEURAL FLUID CHEMISTRY ☐

MICROSCOPY ☐

CULTURE ☐

CHEST X-RAY ☐

CT SCAN ☐

OTHER ☐

IF OTHER, PLEASE SPECIFY _____

_____

Q11. DID THE INITIAL DIAGNOSIS INDICATE YOU HAD TB?

☐ YES ☐ NO

Q12. IF ANSWERED "NO" IN Q14 ABOVE, WHAT WAS THE DIAGNOSIS?
(Tick relevant answers)

☐ EBSTEIN BARR VIRUS

☐ BRONCHITIS

☐ PNEUMONIA

☐ SUSPECTED CANCER

☐ OTHER

IF OTHER, PLEASE SPECIFY_____

_____

Q13. WHAT WAS THE REASON FOR THE MISDIAGNOSIS?
(Tick relevant answers)

☐ LYMPH NODE BIOPSY WAS NEGATIVE

☐ AFB TEST/S WERE NEGATIVE

☐ OTHER

IF OTHER, PLEASE SPECIFY _____

_____

Q14. LOOKING BACK IN TIME WHEN THE ABOVE PROCEDURE/S OR TEST/S WERE DONE, DID YOU DEVELOP ANY COMPLICATIONS?

☐ YES ☐ NO

IF YES, PLEASE SPECIFY _____

_____

_____

Q15. FROM A MEDICAL DOCTOR'S VIEW, IS IT COMMON FOR AN AVERAGE PATIENT TO DEVELOP SUCH COMPLICATIONS?

☐ YES ☐ NO

Q16. DID YOU CONSULT ANOTHER PHYSICIAN FOR A SECOND OPINION FOR YOUR DIAGNOSIS?

☐ YES ☐ NO

Q17. IF YES TO Q20 ABOVE, WHY WAS IT NECESSARY FOR A SECOND OPINION? (Tick relevant answer)

☐ You were not comfortable with the initial diagnosis

☐ To ensure that the diagnosis was correct

☐ You did not have confidence in the first doctor/consultant

☐ Other

If other, please specify _____

_____

_____

SECTION E: LAG TIME

Q18. TIME FROM ONSET OF SYMPTOMS TO DIAGNOSIS (Tick correct answer)

☐ 7 DAYS ☐ 8-14 DAYS

☐ 15-21 DAYS ☐ 22-30 DAYS

☐ 30-6O DAYS ☐ >60 DAYS

Q19. IF TIME LAG WAS MORE THAN 14 DAYS, STATE WHAT CAUSED THE DELAY.

(Tick relevant answer)

☐ Due to a delay in obtaining a second opinion

☐ The initial test/s were not confirmatory for making a diagnosis

☐ The tests were not conducted according to the guidelines set

☐ Delay in accessing or receiving results of tests done

☐ Other

If other, please specify _____

_____

Q20. WAS THE DELAY APPROPRIATE?

☐ YES ☐ NO

STATE A REASON FOR YOUR ANSWER:

_____

_____

_____

SECTION F: TREATMENT

Q21. TIME FROM DIAGNOSIS TO INITIATION OF TREATMENT

(Tick relevant answer)

☐ 1-7 DAYS ☐ 8-14 DAYS

☐ 15-21 DAYS ☐ 22-30 DAYS

☐ 30-60 DAYS ☐ >60 DAYS

Q22. IF MORE THAN 7 DAYS, STATE THE REASON FOR THE DELAY
(Tick relevant answer)

☐ MEDICINE NOT IN STOCK

☐ NON-AVAILABILITY OF ATTENDING DOCTOR

☐ OTHER

IF OTHER, PLEASE SPECIFY _____

_____

_____

Q23. WERE YOU HAPPY WITH THE REASON GIVEN TO YOU FOR THE DELAY?

☐ YES ☐ NO

SUBSTANTIATE YOUR ANSWER.

_____

_____

_____

SECTION G: TREATMENT REGIMEN

Q24. LIST THE NAMES OF DRUGS PRESCRIBED AND THE NUMBER OF MONTHS TAKEN FOR EACH DRUG

NAME OF DRUG	NO. OF MONTHS

SECTION H: SIDE EFFECTS ON PHARMACOTHERAPY GIVEN

(Tick the most appropriate response in each question)

Q25. DID YOU EXPERIENCE ANY SIDE EFFECTS FROM THE PHARMACOTHERAPY?

☐ YES ☐ NO

Q26. IF ANSWERED YES TO Q28 ABOVE, PLEASE SPECIFY….

SIDE EFFECT	ACTION TAKEN

Q27. DID YOU OBTAIN IMMEDIATE RELIEF OF ORIGINAL SYMPTOMS AFTER COMMENCEMENT OF THE TREATMENT?

☐ YES ☐ NO

Q28. IF ANSWERED "NO" TO Q29 ABOVE, WHAT WAS THE REASON?
(Tick the relevant answer)

☐ INAPPROPRIATE DIAGNOSIS

☐ INAPPROPRIATE REGIMEN

☐ INTOLERANCE TO MEDICATIONS

Q30. WHAT WAS THE FINAL DIAGNOSIS
(Tick relevant answer)

☐ TB

☐ MDR TB

☐ XDR TB

Q31. LIST THE SPECIFIC ANTI-TB DRUGS AND DOSAGES YOU WERE COMMENCED ON AFTER THE FINAL DIAGNOSIS WAS CONFIRMED.

Q32. DID YOU HAVE ANY COMPLICATIONS OR SIDE EFFECTS AS A RESULT OF THE NEW REGIMEN?

☐ YES ☐ NO

IF YES, PLEASE SPECIFY

_____

_____

_____

_____

_____

_____

Q33. DID YOU USE NON-PHARMACOLOGICAL MEASURES TO ALLEVIATE SIDE EFFECTS OF ANTI-TUBERCULOSIS TREATMENT? (Tick relevant answer)

☐ YES ☐ NO

IF YES, PLEASE LIST THE MEASURES USED

_____

_____

_____

_____

Q34. DID YOU SEEK THE ADVICE OF HOMEOPATHIC/ALTERNATIVE MEDICINE PRACTITIONERS TO RELIEVE SIDE EFFECTS? (Tick the relevant answer)

☐ YES ☐ NO

IF YES, PLEASE LIST THE TYPES OF PRACTITIONERS YOU CONSULTED WITH

_____

_____

_____

_____

Q35. TUBERCULOSIS REQUIRES A LENGHTY PERIOD OF TREATMENT. I FOUND THE PERIOD OF TREATMENT DIFFICULT TO ENDURE. (Circle relevant answer)

Strongly Disagree Disagree Neutral Agree Strongly agree

Q36. I CONSIDERED DEFAULTING MY PHARMACOTHERAPY DURING MY TREATMENT PERIOD. (Circle relevant answer)

Strongly Disagree Disagree Neutral Agree Strongly agree

Explain your answer

_____

_____

_____

Q37. I MODIFIED MY PHARMACOTHERAPY TO SUITE MY PERSONAL NEEDS.
(Circle relevant answer)

Strongly Disagree Disagree Neutral Agree Strongly agree

Substantiate your answer

_____

_____

_____

Q38. MEDICAL DOCTORS SUSPECTED OF BEING INFECTED WITH TUBERCULOSIS ARE MORE LIKELY TO HAVE ACCESS TO SPECIALIZED DIAGNOSTIC PROCEDURES THAN THE REST OF THE PATIENT POPULATION.
(Circle relevant answer)

Strongly Disagree Disagree Neutral Agree Strongly agree

COMMENT

_____

_____

Q39. MEDICAL DOCTORS ARE GIVEN PREFERENTIAL MEDICAL TREATMENT BY THEIR PHYSICIANS AS COMPARED TO THE GENERAL POPULATION.

(Circle relevant answer)

Strongly Disagree Disagree Neutral Agree Strongly agree

COMMENT

_____

_____

_____

Q40. MY PERSONAL EXPERIENCE WITH TUBERCULOSIS HAS CHANGED THE MANNER IN WHICH I MANAGE MY PATIENTS.

(Circle relevant answer)

Strongly Disagree Disagree Neutral Agree Strongly agree

SUBSTANTIATE YOUR ANSWER

_____

_____

_____

_____

_____

_____

Q41. WOULD YOU LIKE TO ADD ANY COMMENTS TO THE ABOVE INFORMATION, OR DO YOU HAVE ANY OTHER COMMENTS TO MAKE REGARDING YOUR ILLNESS?

_____

_____

_____

_____

_____

Q42. HAVE YOU RECEIVED ANY COMPENSATION FROM THE COMPENSATION COMISSIONER COIDA SINCE YOUR ILLNESS?

☐ YES ☐ NO

PLEASE COMMENT.

_____

_____

_____

_____

Q43. HAVE YOU RETURNED TO WORK?

☐ YES ☐ NO

PLEASE GIVE DETAILS.

_____

_____

_____

_____

Thank you very much for participating in this study. You have assisted me greatly in my understanding of patients' experiences.

I wish you well in your future endeavours and hope that your recovery is complete.

ANNEXURE B 3

Study title: Tuberculosis in Medical Doctors in KwaZulu-Natal (S.A.): Reflections on personal experiences with regards to their diagnosis and treatment

INFORMED CONSENT

CONSENT DOCUMENT

I, (DR/PROF) _____(full name) have been invited to participate in this research study.

An information document about this study has been given to me; the details of this study and my involvement have also been explained to me by the researcher, Dr Ashantha Naidoo.

I am also aware that I may contact the researcher at any time during working hours if I have questions about the research or if I am affected as a result of this research.

The contact numbers for the researcher are:

(031) 360 3500 (W) (CELL) 082 877 12 75

I may contact the **Biomedical Research Ethics Office** on **031-260 4769 or 260 1074** if I have questions about my rights as a research participant.

My participation in this research is voluntary, and I will not be penalized or lose benefits if I refuse to participate or decide to stop at any point in this study.

I agree to voluntarily participate in this research study. I understand that I can stop participating in this study at any time that I may wish to without giving any explanation or being prejudiced in any way.

I acknowledge that I have read this form in its entirety and that its contents have been explained to me. I understand my responsibility in the research study in which I will be participating. I accept the risks, rules and regulations set forth.

Knowing these and having had the opportunity to ask questions which have been answered to my satisfaction, I consent to participating in this research.

_____ _____

Signature of Participant **Date**

_____ _____

Signature of Witness (Where applicable) **Date**